

Inclusion of New Risk Factors Improves Prediction of Invasive Breast Cancer

The new model showed the most improvement for Asian, white and Black women.

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Breast cancer is the most commonly diagnosed cancer in women – with the exception of skin cancer – accounting for 31% of all new female cancer diagnoses in 2022. Yet, determining who is most at risk of breast cancer is still a challenge for the medical community. Physicians use risk assessment models to determine when to start screening, frequency of screening and need for primary prevention.

The [Breast Cancer Surveillance Consortium](#) (BCSC) risk assessment calculator is a validated assessment tool for guiding decisions about prevention and screening. The current model uses information about a woman's age, race and ethnicity, first-degree family history of breast cancer, breast density, and benign breast biopsy results to estimate a woman's 5- and 10-year absolute risk of developing invasive breast cancer.

In a [study](#) published November 17, 2023 in the Journal of Clinical Oncology, UC San Francisco researchers analyzed data from over five million screening and diagnostic mammograms to develop an updated BCSC model for invasive breast cancer to include additional risk factors including body mass index (BMI), second degree relatives with a family history of breast cancer, and age at first live birth to improve model prediction.

"The new BCSC model updates an already well calibrated and validated breast cancer risk assessment tool to include additional important risk factors," said [Jeffrey Tice](#), MD, UCSF professor of Medicine, specializing in breast cancer risk assessment. "The inclusion of BMI was associated with the largest improvement in estimated risk for individual women."

The researchers analyzed data from 1,455,493 women aged 35-79 without a history of breast cancer. During an average follow-up period of 7.3 years, 30,266 women were diagnosed with invasive breast cancer. The new BCSC model (v3) improved prediction of the 5-year risk compared with the BCSC (v2) model.

The new model showed the most improvement among Asians, Whites and Blacks. Among women with a BMI of 30.0 to 34.9 kg/m² (obese level I), the true-positive rate in women with an estimated 5-year risk of 3% or higher increased from 10.0% (v2) to 19.8% (v3), and the improvement was

even greater among women with a BMI ≥ 35 kg/m² (obese II/III) – from 7.6% to 19.8%.

“The BCSC risk model is recommended by the United States Preventive Services Task Force to identify women eligible for primary prevention with tamoxifen or an aromatase inhibitor. Incorporating body mass index into the model more accurately identifies overweight and obese women eligible for taking medication to reduce their risk of breast cancer,” said senior author [Karla Kerlikowske](#), MD, UCSF professor in the Departments of Medicine and Epidemiology and Biostatistics and co-PI of the BCSC.

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